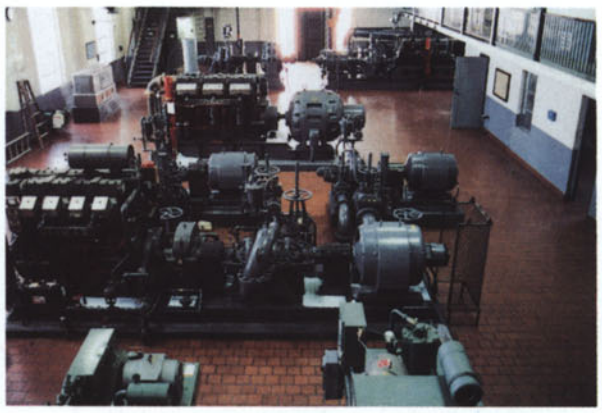
Public Safety

Signal Isolators

NASA Tech Briefs, a monthly publication intended to advise potential users what new NASA technology is available for transfer, is a major source of spinoff applications. On occasion, *Tech Briefs* reports contain sufficient information by themselves to inspire and guide development of a spinoff product or process. More often, *Tech Briefs* provides an initial lead; prospective users can follow up by requesting a Technical Support Package (TSP) that supplies more detailed information about a particular innovation **(see page 141)**.



A NASA technical report provided a solution for computer system failures

The City of Dubuque (Iowa) used the latter approach to solve a problem with the computer system operated by the Water Division of the Utility Department. The system gathers data, both analog and digital, from remote tanks, pumping stations, wells and the division's main plant.

Shortly after the computer system became operational, the division began experiencing failures of the analog inputs ranging from signals out of tolerance by more than 30 percent to intermittent — and sometimes complete — loss of signals. Investigation traced the problem to lack of signal isolation on the analog input cards, which made the inputs vulnerable to interference from storms and machinery. Most of the problems originated in the main plant pump room shown **above**; the pumps have thermocouples mounted on the bearings and their signals are not isolated from the computer inputs.

The division purchased commercial isolation modules that solved the immediate problem. But the Water Division's tight budget demanded a more cost effective long term solution.

Division electronic technician Bob Ervolino read an article in *Tech Briefs* — "Output Isolation and Protection Circuits" — describing an Ames Research Center solution to a problem similar to the Water Division's. He sent for the TSP, studied details of the Ames invention, and learned the name of the vendor supplying the isolation circuit described in the article, Analog Devices, Norwood, Massachusetts. That company suggested other devices, which the Water Division acquired and installed. Ervolino reports that the information supplied by *Tech Briefs* and the vendor solved the problem and saved the Water Division more than 50 percent of the cost of commercial signal isolators. The solution — the signal isolators — is pictured **below**.